

Landmark / DecisionSpace Interpretation Software

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Seisware/Landmark

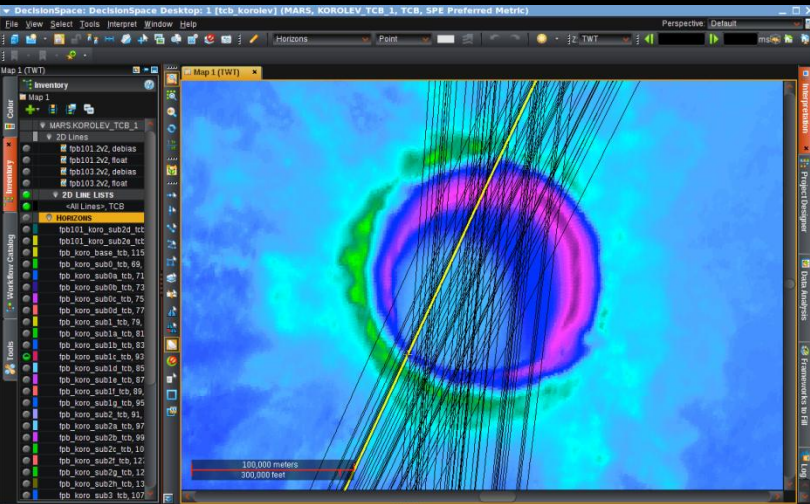
- Both programs are oil field focused, support is offered for “atypical” projects, but often special approaches are required
- Both use seg-y data
- Both have 3-D and 2-D interpretation environments
- Both often offer huge academic license discounts

Key differences: SeisWare vs. Landmark

- SeisWare strengths:
 - A mars ellipsoid!
 - Single package
 - Free 30 day trial
 - Developed on windows for windows
- Landmark strengths:
 - Cutting edge, new features often added
 - Windows and Linux supported
 - DecisonSpace Desktop is a standalone package
 - ArcGIS data support (you can import arc rasters etc.)

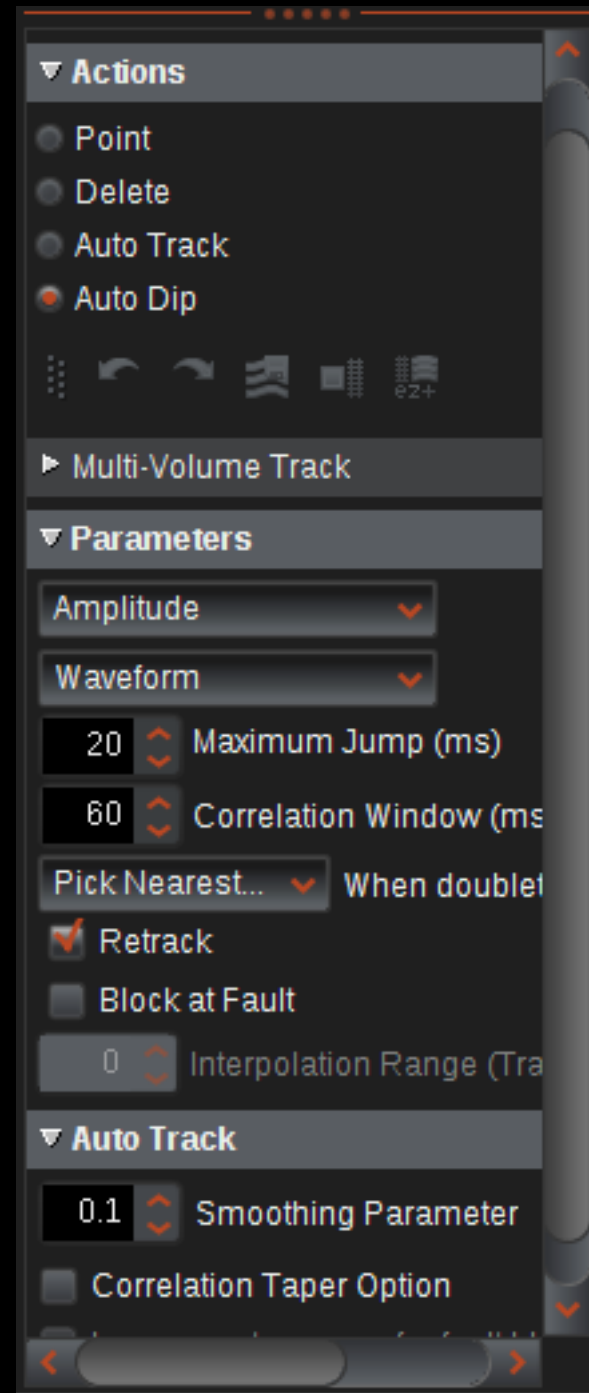
DecisionSpace Examples

- Updated appearance
- Running on a Macintosh laptop connecting via VNC to a Linux machine

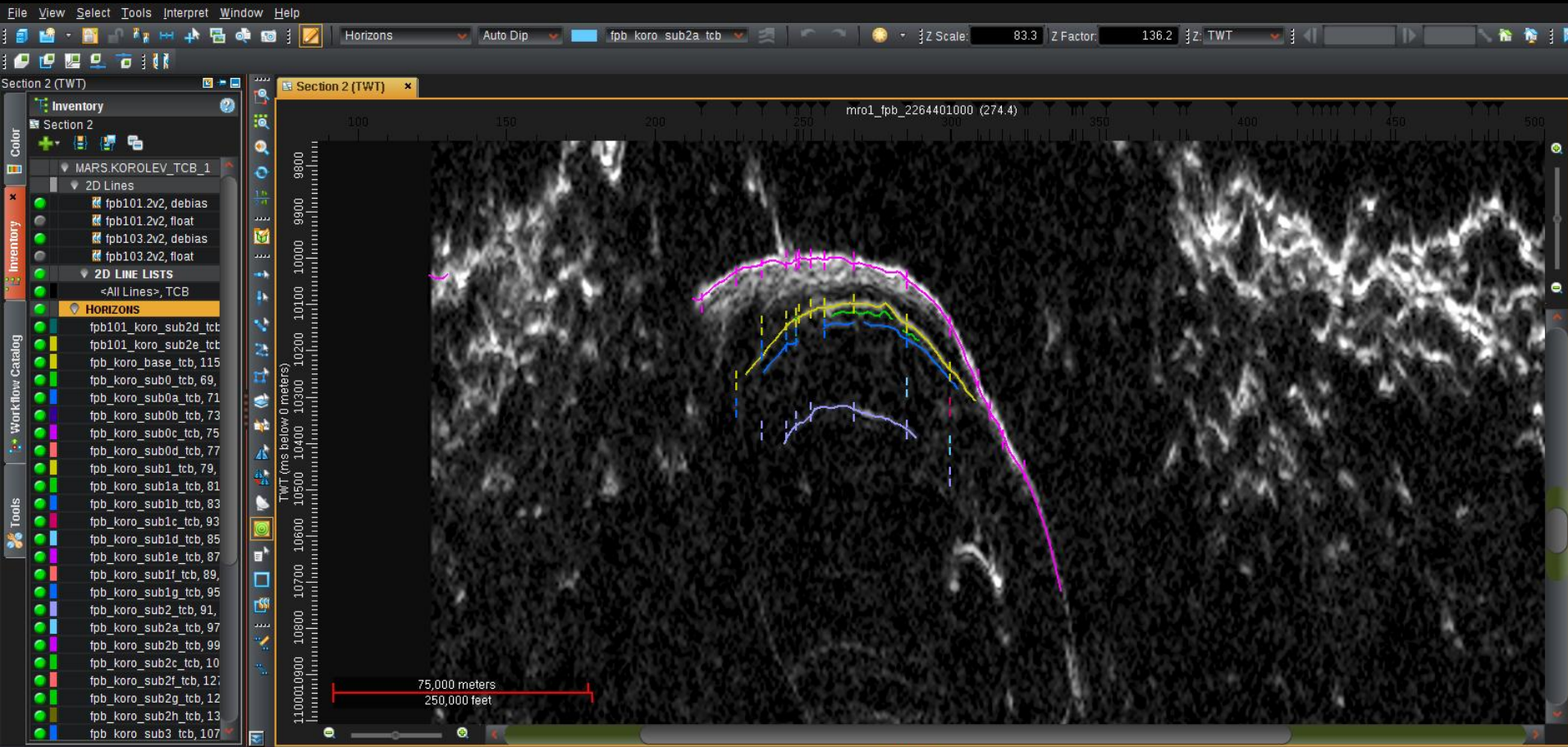


Reflector picking parameters customizable

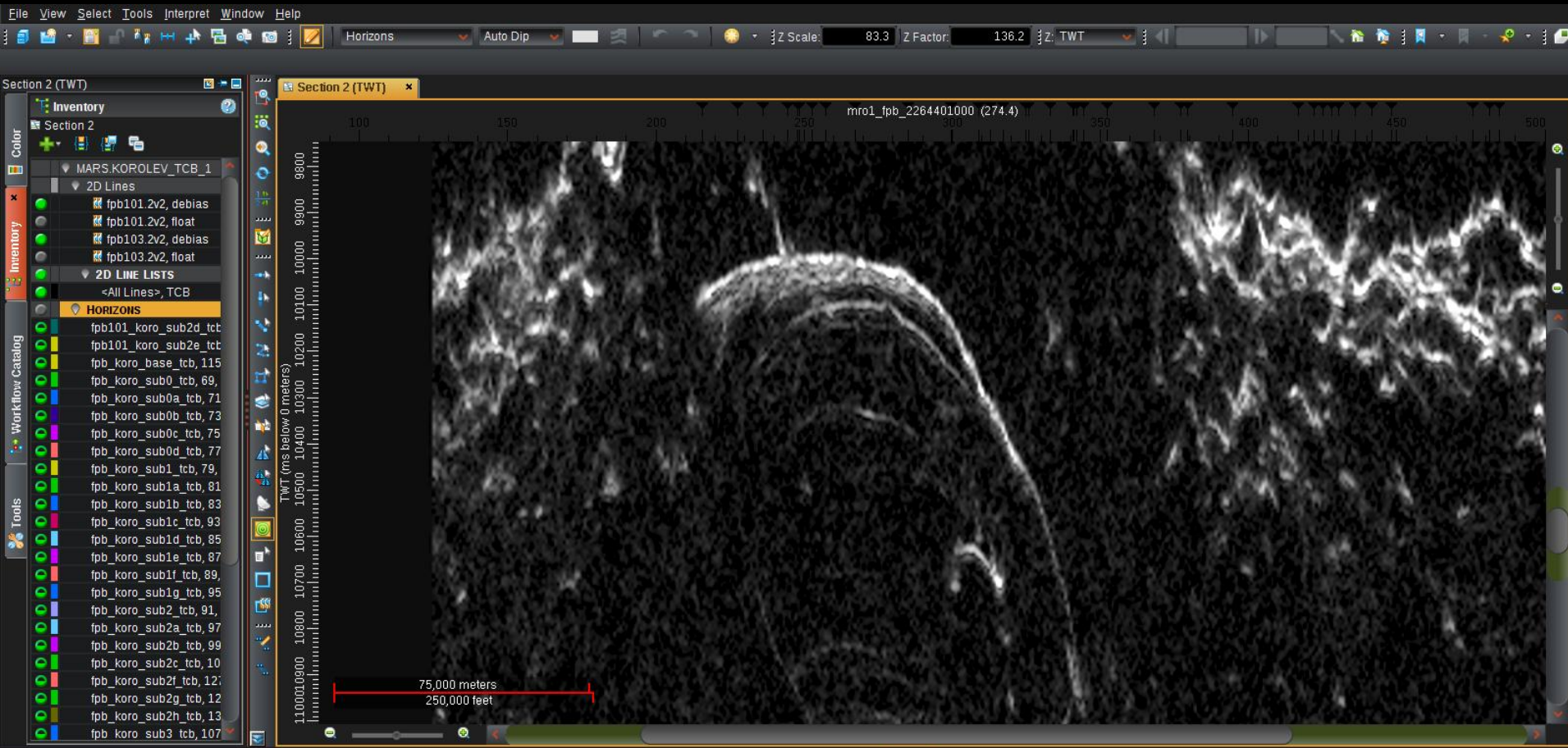
- Point, Auto-Track and Auto-Dip available for tracking radar reflectors
 - At UT we use auto-dip as it gives the best results in our testing
 - Auto-Track and Auto-Dip give reproducible results between sessions and interpreters
- Smoothing parameter extremely useful, as radar is noisy, a low value smooth aids interpretation



Interpretations can quickly be turned on and off



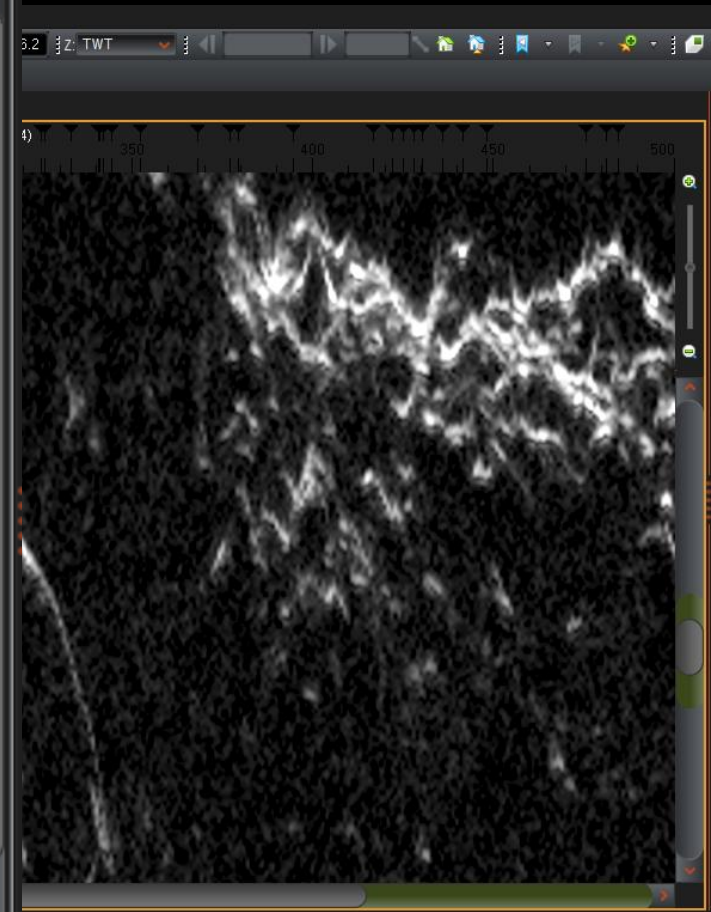
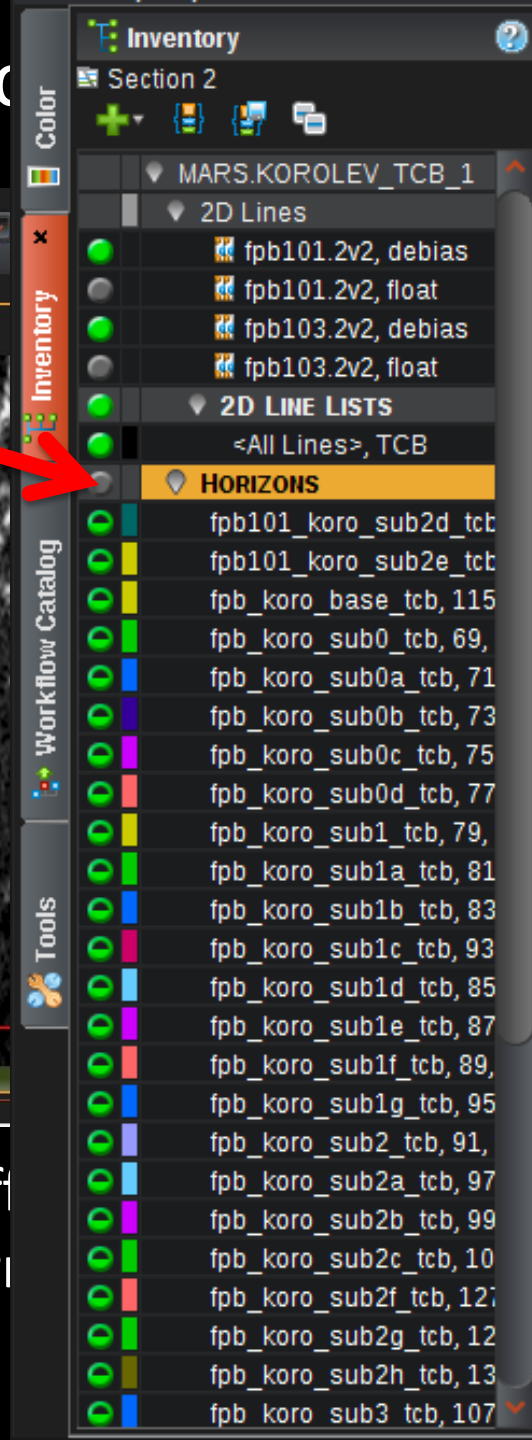
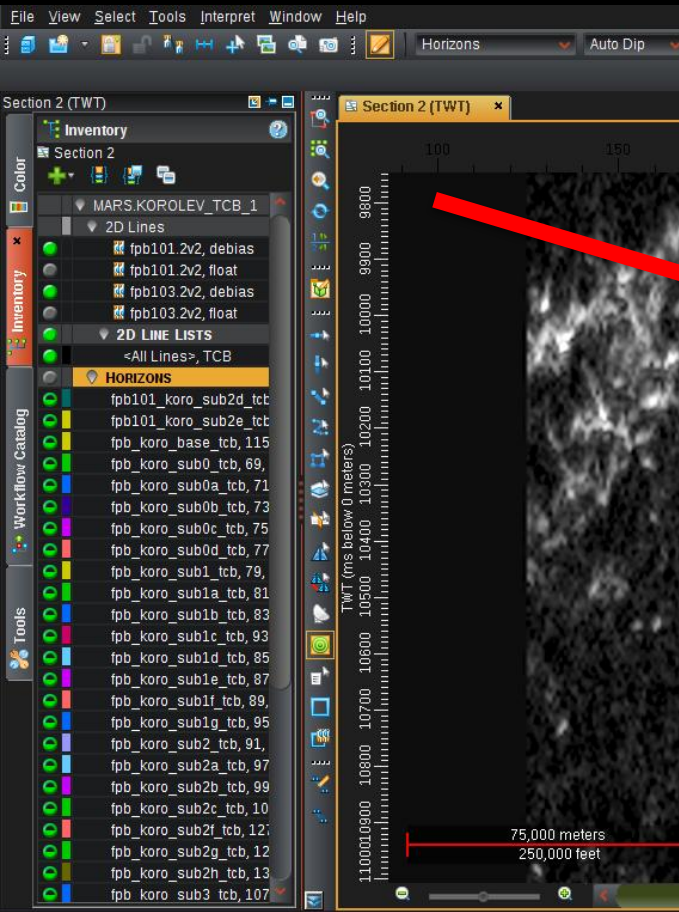
Interpretations can quickly be turned on and off



- Single click turns off and on all horizons, in addition, individual horizons can be turned off and on using this menu!

Interpretations of

turned on and off

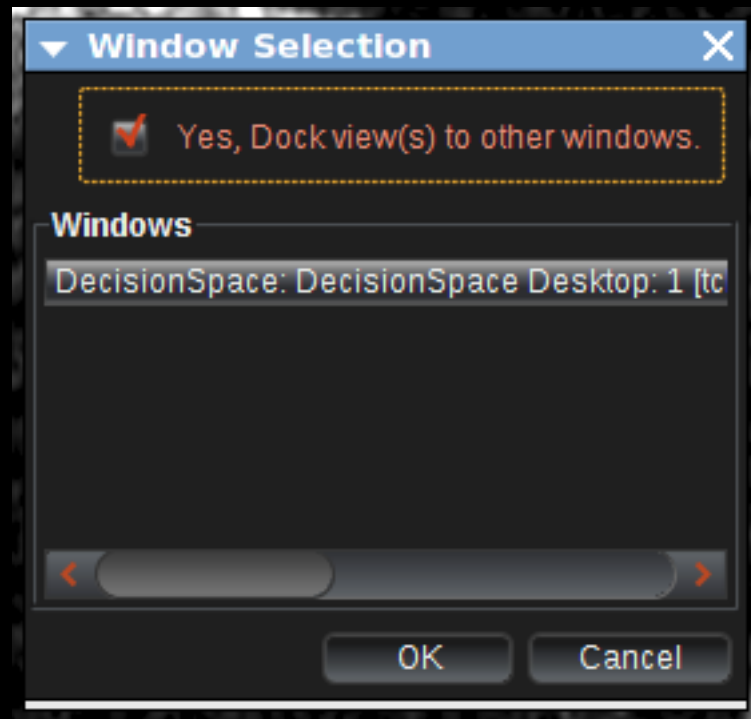


- Single click turns off
- horizons can be turned

in addition, individual
this menu!

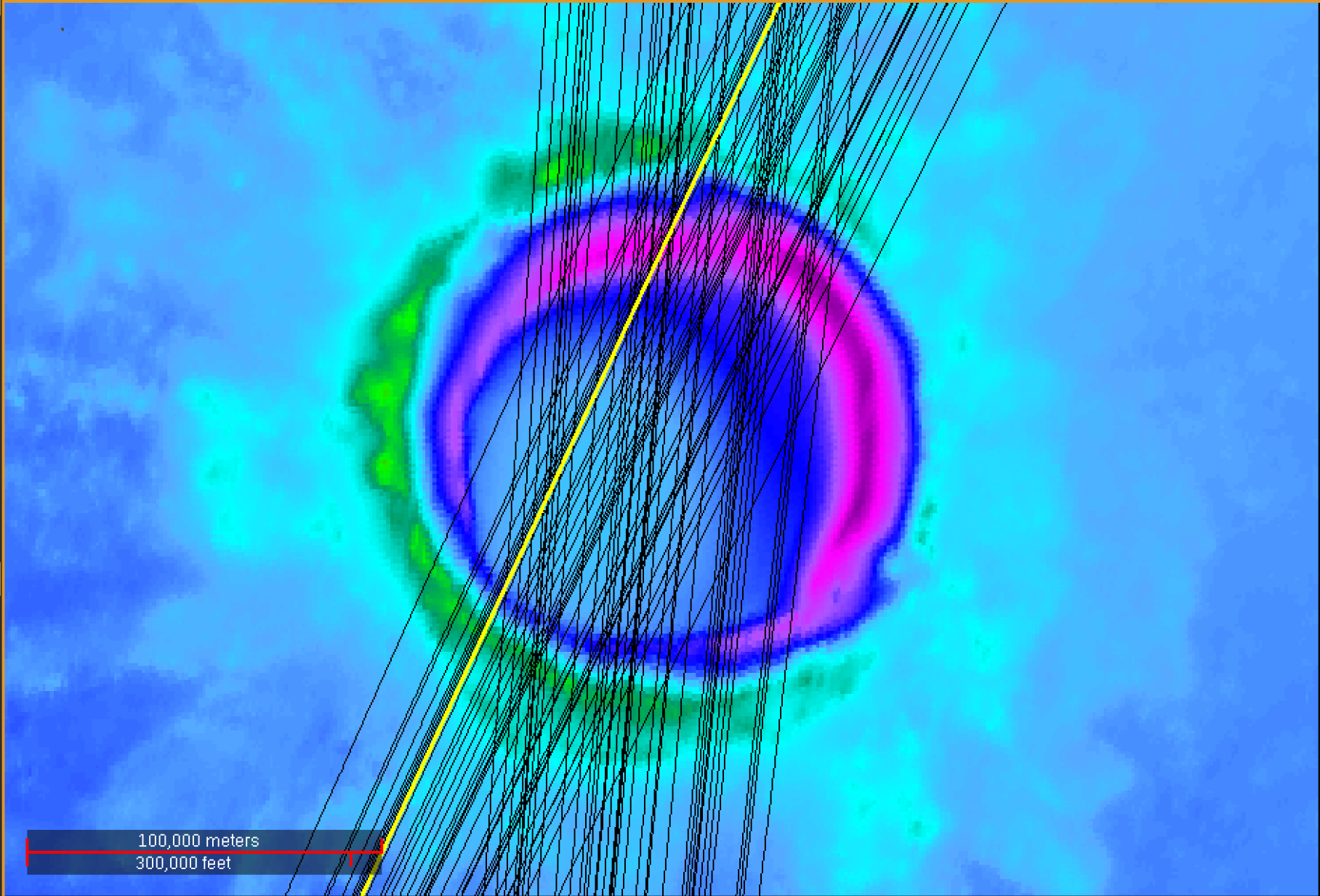
All windows can be combined as tabs

- You can open in “new window” or “new tab”
- When closing a window you can “dock” it as a tab in a different window!



Map 1 (TWT) x

Section 2 (TWT)



100,000 meters
300,000 feet

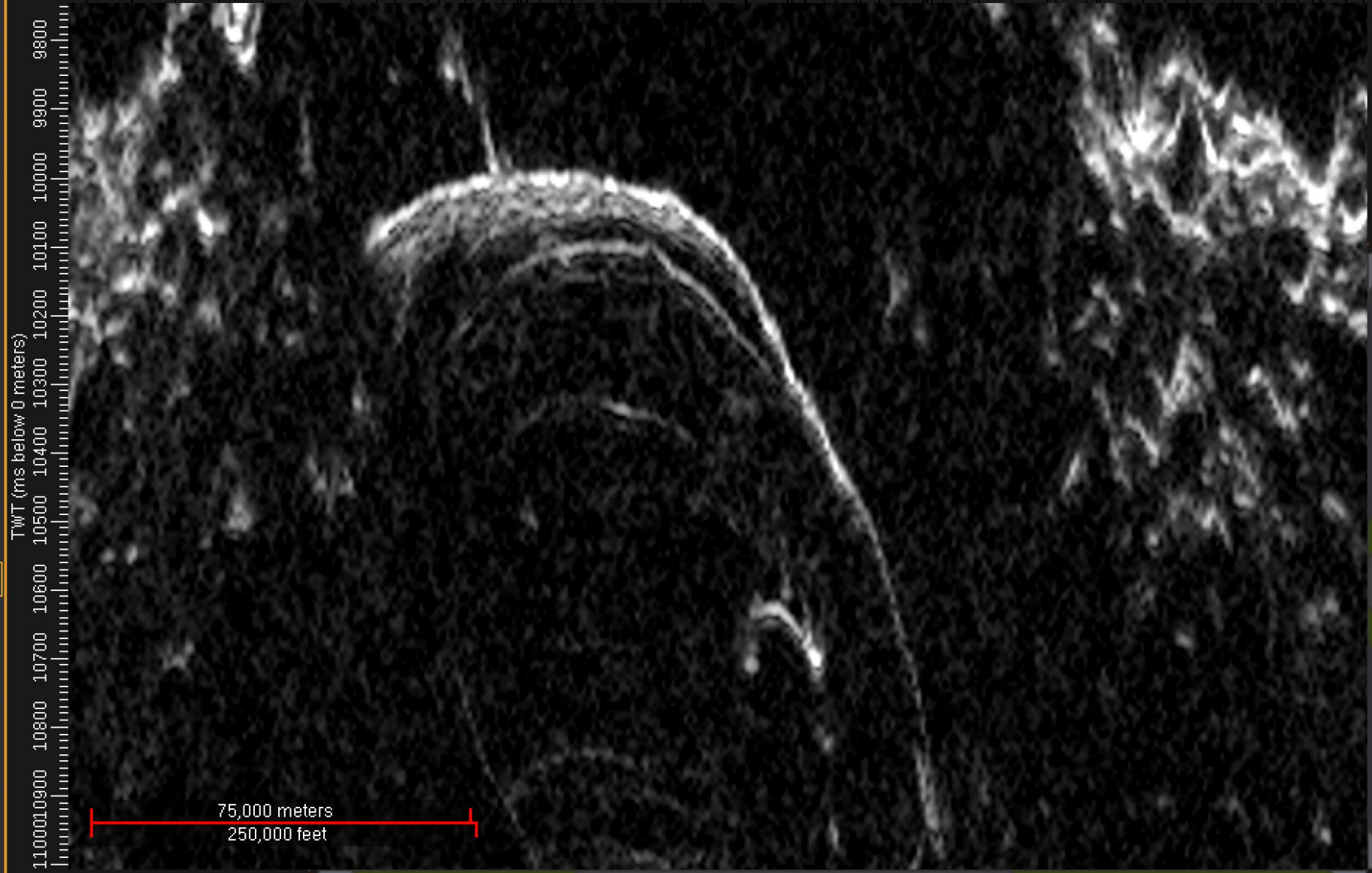


Map 1 (TWT)

Section 2 (TWT) x

mro1_fpb_2264401000 (274.4)

Section 2

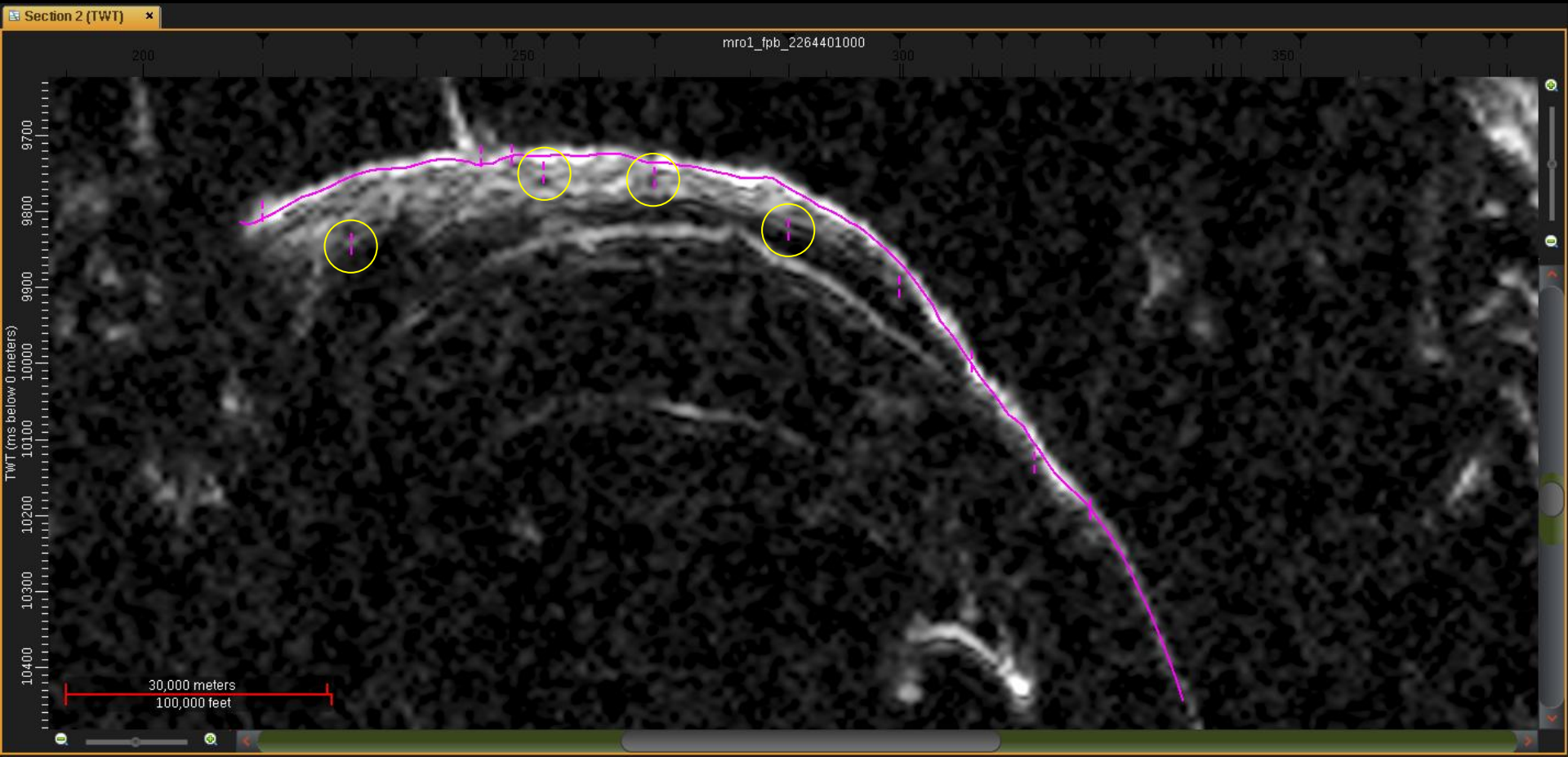


TWT (ms below 0 meters)

75,000 meters
250,000 feet

Mis-tie correction for 2-D data

- SHARAD data doesn't always "line-up"
- Mis-tie algorithm uses an interpreted surface to vertically shift radargrams



Mis-tie options, plentiful!

Horizon Mistle Correction (Section 2)

Domain: TWT Active Shift Set: NoShift Shift Set: NoShift Read in... Save as...

Selection mode: Single By Group

	List Name	Line Name	Survey	Group	Linking	Cluster	Current Shift	New Shift
1	<All Lines>	mro1_fpb_2632302000		Free Float	1	1	0.000	477.221
2	<All Lines>	mro1_fpb_2801101000		Free Float	1	1	0.000	391.044
3	<All Lines>	mro1_fpb_2639502000		Free Float	1	1	0.000	326.887
4	<All Lines>	mro1_fpb_0554201000		Free Float	1	1	0.000	318.028
5	<All Lines>	mro1_fpb_2257101000		Free Float	1	1	0.000	308.094
6	<All Lines>	mro1_fpb_1633401000		Free Float	1	1	0.000	303.357

Auto Analyze Linking/Cluster Analyzed Horizon: fpb_srf_1st_tcb, fpb101, TCB, TIME_STRUCTURE

▼ RMS Misties

Auto Calculate RMS Misties

No Shift	Current Shift	New Shift
732.2841	732.2841	28.812096

Set Save Add Restore Saved Shifts Reset New Shifts

Compute Static Shifts Compute Variable Shift Functions

Horizon... Static Horizon: fpb_srf_1st_tcb, fpb101, TCB, TIME_STRUCTURE

Use Current Shifts in the Computation

Regularization 4 %

Calculated Shifts' Std: 530.68506 Calculated Shifts' Mean: 0.0069551743

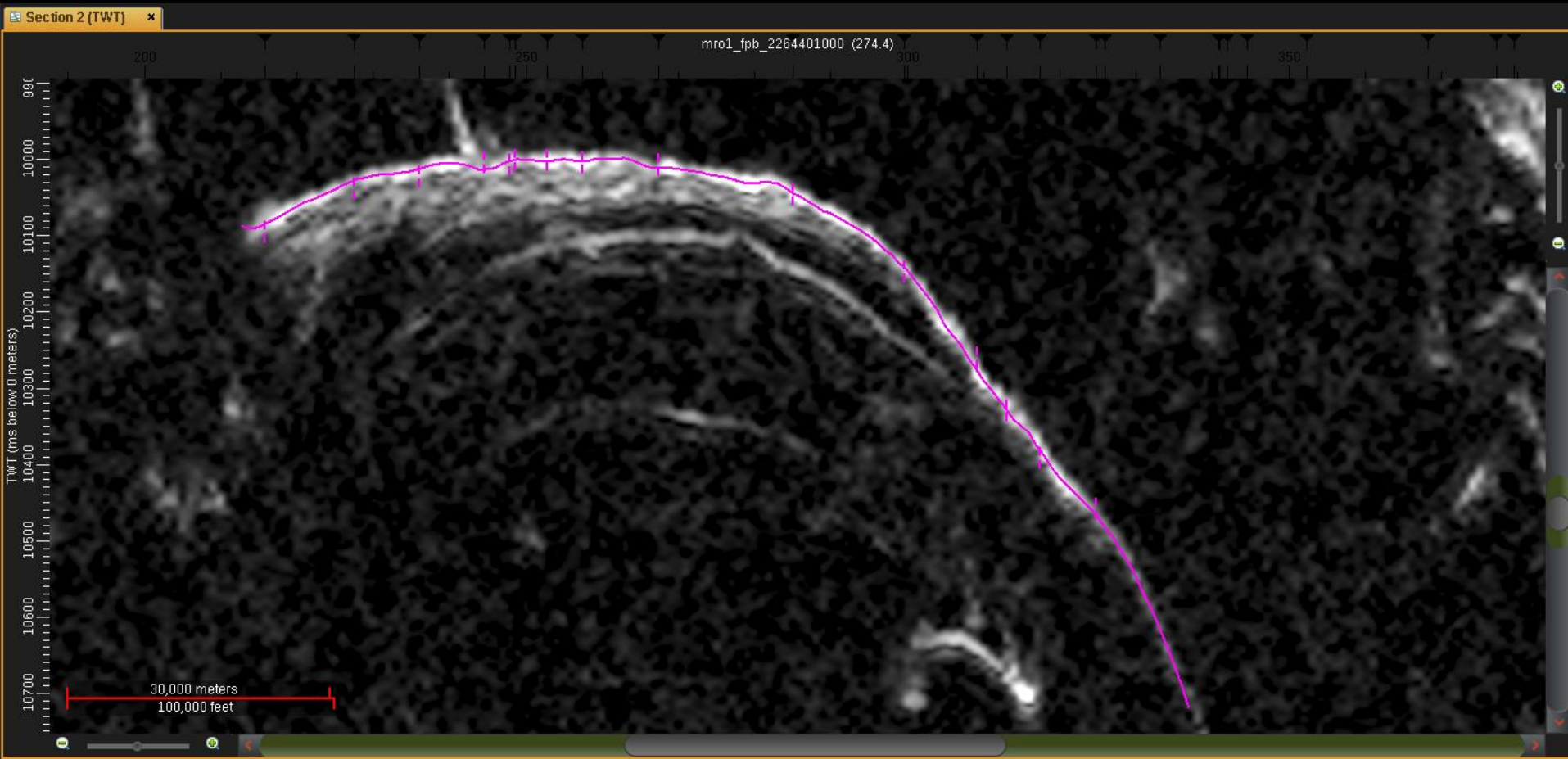
Compute New Shift Values

Section 2

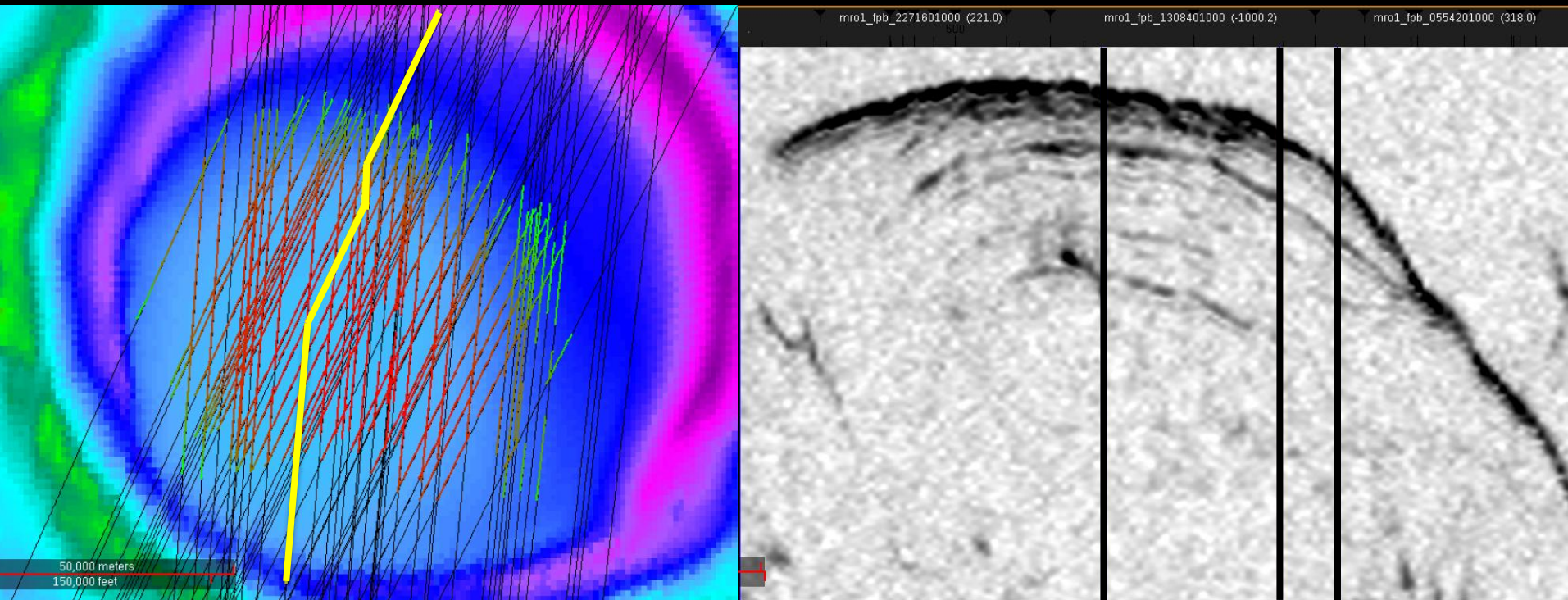
Close Help

Post-mistie correction

- The surfaces line up!

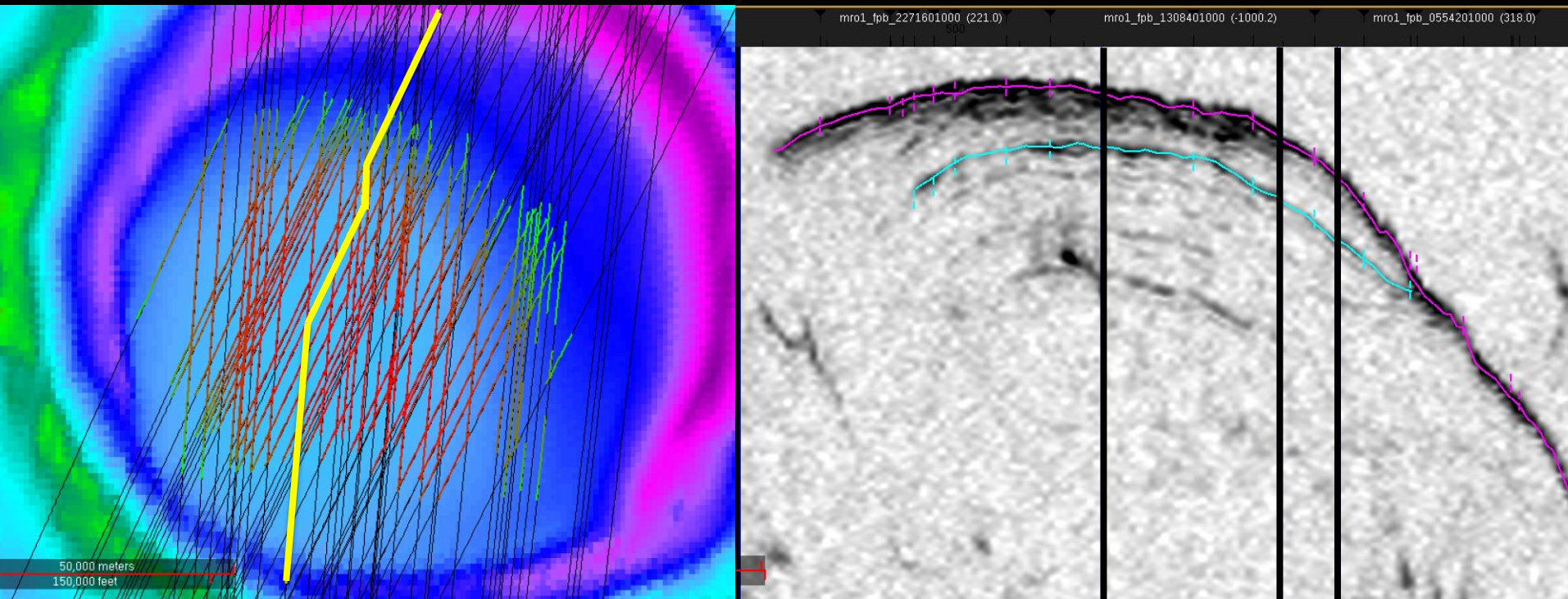


Line ties, interpretation across radargrams



- Multiple orbits combined, can be interpreted across

Line ties, interpretation across radargrams



- Interpretations shown crossing orbits

Post interpretation data options

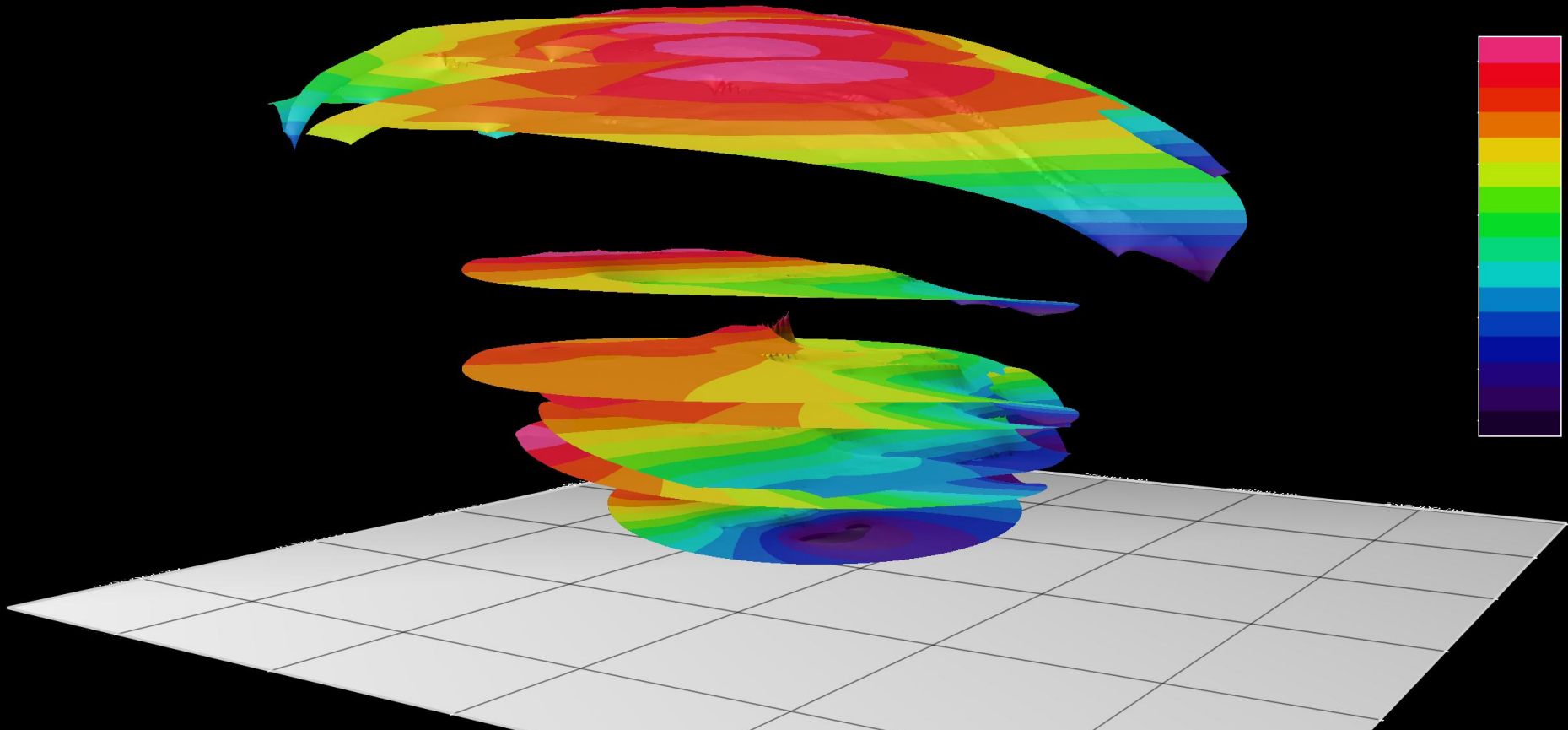
- Data interpolation can be done in DecisionSpace, similar to SeisWare
- Data can be easily exported for use in other programs
 - We export data in ascii format, process into MOLA aeroid, and then interpolate/interpret in ESRI's ArcGIS

Procedure for data export

- Time units depend on how data were loaded, at UT our time units are not ms but $10 \mu\text{s}$
- Data is exported with trace and time
- Surface return can be referenced to MOLA allowing conversion to an XYZ domain
- Pixlatlon file contains latitude and longitude for traces

Data export, products produced

- Once data correctly referenced to MOILA it can be input to GIS software for manipulation and viewing



Reference

Brothers, T.C., and J.W. Holt, Korolev Crater, Mars:
Growth of a 2-km Thick Ice-Rich Dome Independent
of, but Possibly Linked to, the North Polar Layered
Deposits, *44th Lunar and Planetary Science
Conference*, Abstract #3022, 2013